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Magic and the Physical World in Thirteenth-Century Scholasticism

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Abstract
The turn to modern science in the Scientific Revolution of the seventeenth century is typically characterized as dependent on the novel adoption of a mechanical hypothesis for operations in nature. In fact, the Middle Ages saw a partial anticipation of this phenomenon in the scholastic physics of the thirteenth century. More precisely, it was just the two factors, denial of action at a distance and an emphasis on the primary materiality of causation, that constituted this early mechanism—or "protomechanism." The latter's emergence can be seen most clearly where scholastic thinkers—here, William of Auvergne, Thomas Aquinas and Giles of Rome—confronted the theoretical limits of natural cause and effect in their efforts to determine the reality of magic and locate its place in the natural world.

Keywords
action at a distance, cruentation, magical arts, materiality of causation, mechanical hypothesis, natural magic, occult force or power, protomechanism, separate substances, science of images, Augustine, Avicenna (Ibn Sina), Daniel of Morley, Giles of Rome, Hugh of St. Victor, Robert Grosseteste, Thomas Aquinas, William of Auvergne

For many in the contemporary world, the epitome of reason is science. In the United States in particular, science is further defined quite narrowly to mean natural science. In either case, one can make an argument that the resulting cultural priorities have worked to the benefit or, conversely, to the detriment of the conditions of human existence. Political debates over the consequences of "mod-

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ernization," "westernization" and "development" provide abundant evidence of the ease with which opposing positions on the issue can be sustained. Leaving aside such normative concerns, let us for the moment simply take as given the common association of "science" and "modernity" as well as the equally commonplace assumption that "science" in the modern world constitutes a special form of the general category of intellectual artifacts known throughout history by that name, a form of it that is especially rational or reasonably worthy of our estimation. With that as ideological background, this article will focus on just one piece of an influential theoretical model according to which modern science, in particular modern natural science, has been conceived.

Historians commonly take stock of what we call modern science by locating its beginnings in the so-called Scientific Revolution of the seventeenth century. Standard for a long time has been the presumption that the ideological momentum propelling this revolution, and in a formal sense summing it up, was a set of ideas and attitudes called, already in the seventeenth century itself, the "Mechanical Philosophy" or, in Robert Boyle's more cautious words, the "mechanical hypothesis."[1] In his fascinating recent book, *Atoms and Alchemy. Chymistry and the Experimental Origins of the Scientific Revolution*, William Newman offers a useful synopsis of the current historical understanding of "mechanism"—as we might label this philosophy or hypothesis—a complex analytical instrument consisting of at least three parts (or alternatively, three different modulations) in differing degrees of emphasis.[2] The first is "structural reductionism," by which he means the ultimate explanation of all natural phenomena as due to the spatial distribution and interaction of tiny corpuscular components, whether they be thought of as absolutely simple and indivisible or not. Second is "denial of action at a distance," which needs no clarification. The third amounts

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1) See, for instance, the title of one of Boyle's papers: "About the Excellency and Grounds of the Mechanical Hypothesis," included in *Selected Philosophical Papers of Robert Boyle*, ed. M.A. Stewart (Manchester, 1979), 138.

2) William R. Newman, *Atoms and Alchemy. Chymistry and the Experimental Origins of the Scientific Revolution* (Chicago, 2006), 177.

to "rejection of final causes," which again for the purposes of the present essay can pass without comment.

Of these three, I shall be interested in what follows in the rejection of action at a distance, precisely as that characteristic could be considered a necessary attribute of all phenomena occurring in the realm of nature—that is, all those that should be designated "natural." Lurking behind or alongside this was another explicatory demand: insistence on the absolute materiality (or corporeality) of natural causation. Though not explicitly included among Newman's three, this fourth theoretical criterion is imbedded within his first, "structural reductionism," and may be immanent in or inevitably implicated in his second, exclusion of action at a distance. Because the limitation of natural causation to material or corporeal action was still a part of the game in seventeenth-century scientific debate, because in figures like Descartes it was definitely an element of the mechanical understanding of the natural world, and because its ideological presence has so long been taken as an indicator of the mentality of modern science, I have included it as part of a pair with denial of action at a distance. Together, these two will serve for me as identifying indicators of a movement towards at least a part of "mechanism" already in Latin scientific thinking of the high Middle Ages. For brevity's sake, I would like to refer to this medieval and still only partial "mechanism," marked by my two characteristics, as a "protomechanistic" approach or point of view.

Let me begin by suggesting that at the opposite end of the spectrum from those aspects of the mechanical philosophy denying action at a distance and insisting on the materiality of causation lies a vision of action in the natural world where local contiguity is not required nor is materiality a necessary factor in causality, or what we might equally well denominate as the power to induce or generate a natural effect. Such a perspective was, I believe, pervasive in the natural philosophy of the Latin west in the twelfth century—is, I think, invariably taken for granted by historians in what they habitually refer to as twelfth-century Platonism. To my eyes, it was also a property of the eleventh-century Persian Ibn Sina's grand accounting of action in the natural world, so influential in the Latin west from mid-twelfth century on. Though no attempt will be made

in the present essay to justify these two claims, the latter will receive at least oblique confirmation in references to Ibn Sina—cited, of course, according to the Latinized version of his name, Avicenna—made by one of the scholastics I shall deal with soon.[3]

To be quick about it, I want to propose that we do not have to wait until the seventeenth century to witness a significant challenge to the intellectual orientation of such Neoplatonizing natural philosophy among the intellectual elite, for already underway in the Latin universities of the thirteenth century was a shift towards emphasizing contiguous activity and materiality of causation as necessary attributes of natural phenomena. In other words, the "protomechanism" I have in mind was already emerging in the high Middle Ages. In the theoretical disputations of the time—among "artists," or what we would call natural philosophers, but more especially also among theologians—it was where magic came under consideration that we find one of the most prominent instances of recourse to this new and protomechanistic perspective. Magic was, in the thirteenth century, well on the way to becoming a vital concern of university-trained intellectuals not only in their moral and legal considerations of legitimate or dangerous activity in the real social world, but also in their ideological joustings over the content, subject and acceptable explanatory models of science, especially natural science. It is hardly surprising this was so, since the very notion of magic evoked the question of the limitations of activity in and by means of nature.

In the centuries after Augustine, "magic" in the Latin west, on the infrequent occasions when the term was even brought to mind, had been subsumed under the broader rubric of "superstition." By "superstition," moreover, Augustine and those who followed him for much of the Middle Ages intended to designate any activity directed towards the veneration or even gratification of demons or demonic powers, requiring their assistance, or sometimes simply inspired by them and done at their behest. It included idol worship as well as just consulting with demons for whatever knowledge or aid they could provide, but also all efforts relying upon

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3) See below, pp. 174-76.

what Augustine, following the standard usage of his time, called expressly the "magical arts."[4] Among the latter could be listed the innumerable divinatory practices of his time, all the incantatory or amuletic procedures for curing illness, astrology in every guise, as well as the many everyday habits and behaviors that Augustine considered otiose and inane and which most of us today mean when we talk of "superstition"—taking care not to walk under a ladder, for example.[5] What tied these "magical" activities together was not just that they were for the most part unreliable or misleading but also that they either depended upon demonic intervention—as in the case of divination, where demons told diviners what to say, at least in all those instances where what was said was true—or were prompted by demonic suggestion—as in even the slightest "superstitious" habit, which invariably served to turn the performer's moral compass away from reliance on and devotion to God. "Magic" by this construal constituted a semantic category characterized by irreligiosity more than anything else, including the often still concomitant attributes of vanity, deceptiveness or outright privation of the truth.

With the influx of works of natural philosophy or cosmological speculation, derivative in large part of the antique and especially Greek philosophical tradition and translated into Latin from Arabic, Hebrew and finally Greek itself, that we start to see in the cultural world of the intellectual elite of western Europe from the twelfth century on, the near-exclusive dominance of the Augustinian notion of "magic," with its capacious boundaries and largely religious connotations, began to be challenged. For the "scientific" literature of the medieval Arabic, Hebrew and Greek traditions contained within itself elements explicitly construed in that very same tradition as magical. Already by the early twelfth century, alarmed scholars, often monks such as Hugh of St. Victor, had been forced

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4) Augustine, *De doctrina christiana* 2, 74 [xx 30] (ed. and trans. R.P.H. Green [Oxford, 1995], 90): "Superstitiosum est quidquid institutum est ab hominibus ad facienda et colenda idola pertinens vel ad colendam sicut deum creaturam partemve ullam creaturae vel ad consultationes et pacta quaedam significationum cum daemonibus placita atque foederata, qualia sunt molimina magicarum artium… ."

5) Ibid., 2, 74-78 [xx 30-xxi 32], ed. R.P.H. Green, 90-92.

to admit that among the disciplines purported to belong to the arts and sciences of the new learning were those one could do no better than to designate under the simple general heading of "magic" (*magica*). According to Hugh, they fell into five different sorts of learned art: divination or soothsaying and judicial astrology but also fortune-telling (*sortilegia*), sorcery (*maleficia*) and the production of illusions.[6] Although he clearly leaned in Augustine's direction, preferring to see "magic" as capsulized primarily in a moral or religious failing, characterized by turning to demons or falling prey to their wiles, the recent appearance of magical disciplines among the arts almost compelled him to bring to the fore the epistemic qualities of magic as its primary attribute. In any case, there was no ambiguity that he believed it had to be condemned. Its obnoxiousness and failing therefore Hugh felt constrained to characterize as its inherent falsehood. In his words: "Magic is not part of philosophy but rather stands outside it, making false claims [for our attention]. It is [indeed] the master of all iniquity and evil, lying about the truth and truly injuring [our] souls."[7] It is not as if the old Augustinian criticism from a religious standpoint had disappeared. But the claims of magic as art or science had to be confronted, if at all possible confounded as a lie.

Others among the educated, perhaps the majority, were not so convinced that magic in its new guise could be dismissed as nothing more than falsehood and deceit. Among wise Arabs and Jews it had been considered productive of real effects and legitimate pieces of information. Even if some of the products of the so-called magical arts were deceptive and illusory, others most decidedly were not. Reaction to the new arts therefore split into two currents. On one side stood those who were willing to believe that some of the effects and products of some of the magical arts were substantial,

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6) Hugh of St. Victor, *Didascalicon* VI, 15, ed. Charles H. Buttimer (Washington, D.C., 1939), 132: "Haec [i.e. magica] generaliter accepta quinque complectitur genera maleficiorum: manticen, quod sonat divinatio, et mathematicam vanam, sortilegia, maleficia, praestigia."

7) Hugh, *Didascalicon* VI, 15, ed. Buttimer, 132: "Magica in philosophiam non recipitur, sed est extrinsecus falsa professione, omnis iniquitatis et malitiae magistra, de vero mentiens, et veraciter laedens animos… ."

though illegitimate. For them it was not so much the falsehood of magic that characterized it as unworthy of being counted among the sciences welcome in the educational curriculum—though most of these same people believed that a good deal of what came out of the magical arts was illusory and deceptive. Instead, what counted most was the fact that magic relied not on the impersonal workings of elements in the world of nature but rather on spirits, most importantly invisible spirits, that manipulated these elements somehow to unexpected effect or simply passed along a bit of knowledge on the sly to an aspiring magician. These spirits were, of course, evil spirits—demons. The Augustinian view of magic and superstition had maintained as much for centuries, and to that degree this response to magic fell into an Augustinian mold, although unlike in the case of Augustine it was more concerned with magic as a dangerous form of knowledge than with magic as sacrilegious or idolatrous behavior.

A good example of one such stance is Robert Grosseteste's attack on astrology. Grosseteste was an eminent theologian and then prelate of the church in the early thirteenth century. Though he had practiced astrology as a young man, and clearly believed that much could be learned about the course of events here on earth by looking to the circuits of the stars, as a mature scholar he nonetheless attacked the entire art of drawing judgments from the positions of celestial bodies and condemned even the slightest practice of it. His reason was that demons had to be involved, if only to entice people to dabble in a discipline that threatened to undermine the Christian doctrine of free will. After laying out his philosophical and theological arguments against astrology in his late work, the *Hexaëmeron*, Grosseteste concluded with an omnibus prohibition couched fully in Augustinian terms:

> To draw to a close, let us issue the following warning. Practitioners of the art of astrology are seduced and [in turn] seducers, their teachings impious and profane, written at the inspiration of the devil. Their books, therefore, should be delivered to the flames, and not only they, but also all who consult them, are lost.[8]

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[8] Robert Grosseteste, *Hexaëmeron* V, xi, 1, ed. Richard C. Dales and Servus Gieben (London, 1982), 170: "Hec tamen in calce volumus admonere, quod huiusmodi

On the other side of the divide, heading in another direction, were those even readier to accept the possibility that some of the magical arts could generate substantial effects or often reveal the truth but who now embraced these same arts with open arms. A case in point is the English scholar of the late twelfth century, Daniel of Morley, who in his *Liber de naturis inferiorum et superiorum* sang the praises of the judicial art of the stars, which he designated as the science of *astronomia*. This latter was, moreover, an extremely inclusive branch of learning. Of it, Daniel proclaimed:

> Concerning the dignity of this [science], we find—as the sages of old have told us—that it is divided into eight parts. They are the science of judgments, the science of medicine, the science of necromancy *secundum physicam*, the science of agriculture, the science of illusions, the science of alchemy, which is the science of the transformation of metals into other kinds, the science of images, which has been passed down to us by the great and universal *Book of Venus* composed by Thoz the Greek, and the science of mirrors. This [last] science is more fruitful and comprehensive than the others, as Aristotle makes clear in his *Book of Burning Glasses*.[9]

Obvious to any educated reader would be the fact that several of these disciplines were identical with those that Hugh of St. Victor had anathematized as magical, not just evil but also unproductive of the truth. To Daniel's eyes, however, there was nothing wrong with these arts. He granted their claim to be included among the sciences and even suggested that among the learned disciplines they held a position of eminence. No mention here of demons. Instead, the magic Daniel had in mind—though he prudently avoided employ-

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iudices seducti sunt et seductores, et eorum doctrina impia est et profana, diabolo dictante conscripta. Ideoque et libri eorum comburendi; et non solum isti, sed eciam qui consulunt tales sunt perditi."

9) Daniel of Morley, "Philosophia" X, 158, ed. Gregor Maurach, in *Mittellateinisches Jahrbuch* 14 (1979), 239: "De dignitate eius invenitur, quod illius partes, secundum quod dixerunt sapienties primi, octo sunt, scil<icet> scientia de iudiciis, scientia de medicina, scientia de nigromantia secundum phisicam, scientia de agricultura, scientia de prestigiis, scientia de alckimia, que est scientia de transformatione metallorum in alias species, scientia de imaginibus, quam tradit Liber Veneris magnus et universalis, quem edidit Thoz Grecus, scientia de speculis, et hec scientia largior est et latior ceteris, prout Aristotiles manifestat in Libro se speculo adurenti."

ing the word itself—held the key to knowledge of some of the most wonderful, perhaps wondrous, workings of nature, shorn of the intervention of willful, hence unpredictable personalities or spirits.

In light of these last two points of view, accepting at least some of the effects and results of magic but debating over their origin and thus the worthiness of the relevant arts to be taught and practiced, it should thus be clear why, as noted above, magic or magical operations would by the thirteenth century have become a crucial theoretical site on which could be fought out differing claims about just how nature worked. Merely defining magic demanded taking a stand on the boundary between natural operations and those either outside of nature or above it. The fact that it was magic out of all other possible limiting cases that commonly provided this opportunity in the high Middle Ages means therefore that we should expect medieval discussions of magic to have a central place in our investigation of the contours of scholastic natural philosophy, including the question of whether any such "protomechanism" of the sort I am interested in actually existed.

In this essay I attempt no more than to make a contribution towards launching the discussion. In fact, I must confess to being a bit behind the curve. Already scholars such as Béatrice Delaurenti have begun to examine questions of causality, materiality and contiguity in scholastic natural philosophy precisely with reference to debates about the character and efficacy of magical operations and their relation to other phenomena observable in the world around us. [10] To give an idea of some of the evidence that I, myself, have begun to accumulate in support of my proposition about the early signs of mechanism in medieval thought, I shall look at the work of three philosopher-theologians, all of whom at some point exercised the magisterium in the Faculty of Theology at Paris in the thirteenth century. The first is the secular canon and later bishop of Paris, William of Auvergne, who died in the episcopal office in 1249. Second is Thomas Aquinas, Dominican friar and master of theology first at Paris but then also in other *studia* and universities

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10) Béatrice Delaurenti, *La puissance des mots. "Virtus verborum"* (Paris, 2007).

at the behest of his Order, whose death occurred in Italy on his way to the Council of Lyon in 1274. Last comes a friar of the Order of Austin Hermits, Giles of Rome, who, having returned to Paris in 1285 as master of theology after suffering the indignity of seeing his original inception into the magisterium impeded in 1277, ended his days as an honored prelate of the church, dying in Avignon in 1316. I hope to demonstrate a progression among the three, from William of Auvergne, still much immersed in the Platonic, Avicennian naturalism dominant in the Latin twelfth century but open to the conception of natural action as confined to the cause and effect of contiguous, material objects, through Thomas, committed to the clarification and firmer establishment of the new perspective, to Giles of Rome, most "mechanistic" of the three, for whom almost no room remained in nature for action at a distance and arising from an immaterial source. I limit myself to the comments of all three on magical effects and their location in the natural order.

William of Auvergne

For William of Auvergne, I rely on two of his treatises, both constituents of a sprawling survey of all reality, from the heights of divinity to the depths of the earth, as it might prove of interest or utility to human beings. The entire collection, which he entitled *Magisterium divinale ac sapientale*, William started compiling in the early 1220s, stopping short of the projected finish in the mid-1240s, just before his death. Of the two pieces of this work examined here, the more important is the treatise *De universo*, the foundations of which might well have been laid in writings composed in the 1220s, all of them, however, greatly reworked in the 1230s, with some parts not receiving their finishing touches until around 1240. Less significant for my purposes, but useful all the same, is *De legibus*, intended to be paired in the Magisterium with a further treatise, *De fide*, and written sometime after 1228, most likely before 1231.[11]

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[11] On dating William's writings, see primarily Guglielmo Corti, "Le sette parti del *Magisterium divinale ac sapientiale* di Guglielmo di Auvergne," in *Studi e ricerche di*

Long stretches of *De universo* and passages in *De legibus* are devoted to a frontal attack on many of the magical arts, some of which William claims to have been familiar with from the days of his youth, when he dared to peruse what he later would disavow as the detestable books of necromancers, such as the *De deo deorum* from the Hermetic corpus and the *Liber sacratus*, or *Sworn Book of Honorius*.[12] Whether of necromantic origin or not, however, all the arts William had in mind fell under his rubric, *opera magica*, which by his maturity he considered illicit and evil from beginning to end. For clarity's sake he divided its contents into three subcategories: first, the arts underpinning what we would designate as sleight of hand; second, those concerned with the evocation of false appearances by more complicated manipulation of special substances, natural confections and odd apparatuses; and third those relying on the invocation of demons to work even more startling effects.[13]

Especially the object of William's disdain among the practices associated with the *opera magica* were astrology, which he took to be completely inefficacious insofar as it presumed to predict spe-

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scienze religiose (Rome, 1968), 289-307, revising but still drawing heavily on the earlier work of Josef Kramp in *Gregorianum* 1 (1920) and 2 (1921).

12) See William, *De universo* II, 3, 20 (from his *Opera omnia* [Orleans, 1674; reprinted Frankfurt am Main, 1963], I: 1056aH-bE); and *De legibus* 24 (*Opera omnia*, I: 70aF) and 25 (*Opera omnia*, I: 77bD). On the identity of the second of the two works William mentions, see first of all Robert Mathiesen, "A Thirteenth-Century Ritual to Attain the Beatific Vision from the *Sworn Book* of Honorius of Thebes," in *Conjuring Spirits. Texts and Traditions of Medieval Ritual Magic*, ed. Claire Fanger (University Park, Penn., 1998), 143-62, at 145-47; and Richard Kieckhefer, "The Devil's Contemplatives: The *Liber iuratus*, the *Liber visionum* and Christian appropriation of Jewish Occultism," also in *Conjuring Spirits*, 250-65, at 253-54.

13) William, *De universo* II, 3, 22 (*Opera omnia*, I: 1059aA-bA): "Post haec veniam ad opera hujusmodi, quae opera magica, et ludificationes vel hominum vel daemonum, nuncupantur. Dico igitur in primis, quia horum tria sunt genera: alia namque fiunt agilitate habilitateque manuum … et vocantur vulgariter tractationes vel trajectationes, et sunt magnae admirationis hominibus, donec innotescant modi quibus fiunt. Secundum genus est eorum, quae non habent nisi apparentiam et nihil omnino veritatis, fiunt tamen subtractione vel adhibitione quarumdam rerum… . Praestigium quoque, quo apparet aqua vel fluvius, ubi revera aqua non est, nisi intus vel extra aliquid adhibeatur spectantibus, quod hujusmodi fallaciam visus efficiat, non videtur possibile… . Quapropter hic scilicet in hoc praestigio solum malignorum spirituum ministerium operari videtur."

cific occurrences or to bind humans' will ("[*judicia*] *extend*[*ere*] *in res particulares et voluntarias*"), and what he called the "doctrine (or discipline) of images" (*magisterium imaginum*).[14] Much of his commentary on magic in the two treatises was invested in showing how these two were illegitimate—either false or diabolical or both. But he also took aim at a host of other wondrous but impious acts, such as casting spells or performing obscure, irreligious rites, by which people were brought to believe in the extraordinary powers of magicians and kindred wonder-working seducers into idolatry. These acts, as indeed the manipulation of images in those cases where by appearances it seemed to meet with success, were entirely due to the machinations of demons working invisibly, behind the scene. They consequently fell into the third of William's subcategories of *opera magica*. And as in all such instances where invisible spirits intervened to trick people with their marvelous operations, they worked only to the extent that these spirits called upon the commonplace modes of operation evident throughout the rest of nature. Using natural objects and natural processes of cause and effect, they thus managed—while acting surreptitiously because unseen—to produce results that could not but appear astounding to the uninformed. To those aware of the demons' activity, on the other hand, the very same results would be neither surprising nor regarded as somehow violating the normal rules of nature.[15]

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14) For William's attacks on astrology, denying its efficacity almost completely, see William, *De universo* I, 1, 46 (*Opera omnia*, I: 664aG-bE); I, 3, 20 (*Opera omnia*, I: 785aD-bB); and especially II, 2, 76 (*Opera omnia*, I: 929bA): "Quoniam autem apud astronomicos judices, hoc est doctores judiciorum, qui ea extendunt in res particulares et voluntarias, iste modus operationis neque novus neque inopinatus est, conveniens est ut adjuveris quantum possibile est contra errorem eorum, similiter et contra errorem eorum, qui magisterium imaginum professi sunt… ." On the *magisterium imaginum*, see William, *De universo* II, 2, 76 (*Opera omnia*, I: 929bA)—also quoted just above. He called adepts in this same art or learning "*magistri operum*"—see *De universo* II, 3, 12 (*Opera omnia* I: 1039aC). An extraordinary historical investigation of attitudes towards this latter art, more often referred to in the thirteenth century as the "science of images," is Nicolas Weill-Parot's *Les "images astrologiques" au Moyen Âge et à la Renaissance* (Paris, 2002).

15) William, *De universo* II, 3, 12 (*Opera omnia*, I: 1039aB): "Et intendo facere te scire in sequentibus causas hujusmodi fantasiarum, viasque et modos quibus naturali-

For William, in fact, the vast majority of operations one might observe in the world—including of course most of those considered so far among his *opera magica*—were not only entirely natural but also explicable, for the perceptive and informed observer, by means of the most mundane laws of natural operation. Here is where William's nascent "mechanism"—"protomechanism" as I have called it in deference to the originality of the seventeenth century—emerges most clearly into view. As he explained in unambiguous terms, all natural activity was brought about by one of two modes: either by contrariety, when an agent overcame or erased a contrary attribute of an object falling under its influence, or by assimilation, as when an agent induced a formal similitude of itself in an object upon which it worked.[16] By way of example for the latter sort of operation, William reminded the reader of how something hot made another object upon which it acted hot as well by impressing on it a similitude of its own activating form—that is, the form of heat. Though he gave no example for the first kind of operation, we can easily supply one for him. A solid entity at rest, such as the grassy ground beneath an apple tree, will overcome the local motion downwards of a ripe fruit falling upon it, causing the once-moving fruit likewise to adopt the form of rest. All this was, to be sure, no more than a summary of the standard Aristotelianizing account of formal agency. More interesting, however, is the recognition that no sooner does one reduce the focus to the business of natural activity in the material world, than an additional restriction on the operative process comes into play. As William explained it, natural operations in the world of corporealities required contact of the agent with the object acted upon, whether it be immediate contact—as

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ter fiunt. [N]am et ipsi maligni spiritus per res naturales haec omnia faciunt… ." On *magisterium imaginum*, wherever effective, having to operate by the same means, see *De universo* I, 1, 46 (*Opera omnia*, I: 663a[A-B] and 663bD).

16) William, *De universo* II, 2, 76 (*Opera omnia*, I: 929b[C-D]): "Et quod dico … intendo secundum modum agendi naturalem, qui est secundum duos modos, videlicet interdum secundum victoriam alterius contrariorum super alterum … . [S]ecundus modus est per similitudinem sive assimilationem, qua agens assimilat sibi patiens, imprimens ei similitudinem per quam agit, sicut calidum calorem et lucidum lumen et ad hunc modum de aliis."

when the apple hits the ground—or mediated contiguity—as when hot embers result in burnt fingers for those touching the andirons on which the embers rest. [17] So far as concerns most operations in the world that we inhabit, therefore, nature works precisely when one material thing is brought into contact with another.

Not that there were no exceptions. Indeed, for human beings, the exceptions accounted for a significant part of what it meant to live and act in the world. The exception most relevant in this regard—and it was surely the primary exception in day-to-day affairs to the normal rule of natural action by means of material contact—involved the case of an embodied soul, such as a human soul or the soul of a dog or cat. Souls had the power to move the bodies they inhabited without recourse to material agency and consequently without reference to anything like local contact or even precisely determinate physical place. And the fact that this was true indicated that William's "protomechanism" extended only so far. Nonetheless, with regard to the ways that human or most other animate beings intervened in their surroundings, the exception was still only partial and quite limited. Souls attached to bodies had the non-corporeal but nonetheless natural power to move those bodies, yet by grace of this initial corporeal effect alone could they then intervene in the rest of the material world around them, either directly by means of an organ of the body or indirectly by further deploying an artificial instrument or tool.[18] Among humans, that was the quickest and commonest way to act.

There was, however, a further exception, and it demands our closest attention. Some operations involving bodies in nature could not be characterized as a formal change or modification obedient to the

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17) William, *De universo* I, 1, 46 (*Opera omnia*, I:663aA): "Operationes enim corporales per modum naturae per contactum sunt aut mediatum aut immediatum, quod est dicere, quia corpus virtute sua coporali non agit, nisi vel in corpus quod contingit vel in aliud contingens illud."

18) William, *De universo* I, 1, 43 (*Opera omnia*, I:648a[F-G]). This passage is given great attention by Delaurenti in *Puissance des mots*, pp. 126-27, although she interprets the action of the soul upon its own body as itself in conformity to the law of natural action by contact. As I indicated just above, there is no point of contact—no true local contact at all—between a soul and its body.

rules of similarity or contrariety. In such cases the action was frequently due to a hidden force or power (*vis*, *virtus*, *potentia occulta*), still natural but usually unexpected, difficult to describe in concrete terms, and in any event not mundane.[19] Not only, William explained, were the "books of experiments" and "natural histories" loaded with descriptions of these occult yet natural powers, but also much of the art of medicine depended upon them.[20] In instances where an occult power was at work, results were produced that could not be related back to the cause itself according to a formal resemblance or a formal opposition or contrariety, nor understood in any such terms. It was as if a hot body should automatically induce not heat but rather whiteness in another, or something falling on a surface at rest should continue to move, and even faster.

An example of such an operation, so William said, was the power of a sapphire to cure infirmity, restrain ardent passion and calm fears. With reference to this example, in *De legibus* he specifically remarked that, in contrast to the operations of more typical agents in the world, in the case of a sapphire turned to medicinal purposes, it was neither the agent's matter nor its substantial form (nor presumably any accidental form as well) that accomplished the healing or restraining result. For the action of matter here, perhaps he had in mind a process like the solid ground stopping the progress of a falling apple; for substantial form, surely the natural procedures of generation, as when a mature dog engendered a puppy; and for accidental form—had he bothered to mention it—of course a hot body warming that which it touched. In any case, the sapphire

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19) William, *De universo* II, 3, 21 (erroneously printed as 20) (*Opera omnia*, I: 1058bH): "Sunt et alia, quae commixtionibus et aliis conjunctionibus naturarum fiunt, de quibus multa innotuerunt, plurima autem adhuc in abscondito sunt. Harum igitur naturarum vires et potentias occultas, qui noverunt, multa mirifica faciunt, et multo mirabiliora efficerent, si rerum eis hujusmodi facultas et copia suppeteret et scientia non deesset." See also *De universo* II, 3, 22 (*Opera omnia*, I: 1060aE): "Hic igitur advertendum est tibi, quia virtutes occultae multae et mirabiles sunt in rebus quas attingere non possumus… ."

20) For *libri experimentorum* and *libri naturalium narrationum*, see William, *De universo* II, 3, 22 (*Opera omnia*, I: 1060bF); on medicine, *De universo* I, 1, 46 (*Opera omnia*, I:663bD-64aE); and II, 3, 22 (*Opera omnia*, I:1060aH).

worked the cure or restraint instead "by means of its whole nature" ("*secundum totam naturam*").[21] These latter words surely reflect acquaintance with the Galenic idea of medicinal effect, whenever not by the evident elemental properties of the curative agent, then by the "property of the whole substance."[22] Operations like this might work even at a distance, so William believed.[23] More noteworthy still, he thought of them as belonging to a category of actions he was prepared to designate by—of all words—the adjective "magical." Indeed, in all instances of this sort what was at work, said William, was a "natural magic," resident right there in nature to be made use of in a "natural art of magic."[24] And in sharp contrast to those occasions where he spoke of *opera magica,* this time the magic, so long as it was not applied to harm, was anything but evil, indeed highly to be praised.[25] "Magical" in this positive sense thus pointed for William to a part of nature where operations, even operations among objects fully embedded in the material world, escaped, in a most spectacular and perhaps old-fashioned or Neoplatonizing way, the protomechanism he had elsewhere revealed himself ready to embrace.

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21) William, *De legibus* 27 (*Opera omnia*, I:86bH-87aA).

22) For the Galenic idea, see Newman, *Atoms and Alchemy*, 141; and Brian P. Copenhaver, "Scholastic Philosophy and Renaissance Magic in the *De vita* of Marsilio Ficino," *Renaissance Quarterly* 37 (1984), 523-54, at 525.

23) Begin with the not precisely pertinent case—because the agent was a soul and not a material form—of the basilisk as presented in *De universo* I, 1, 43 (*Opera omnia*, I: 648aF): "[Q]uia forsitan anima basilisci, et animae quorundam aliorum animalium et quaedam animae humanae, multa operantur et mira valde extra corpora sua… ."

24) For *magia naturalis*, see William, *De legibus* 24 (*Opera omnia*, I: 69bC-D): "Et de operibus hujusmodi est magia naturalis, quam necromantiam sive philosophicam philosophi vocant, licet multum improprie, et est totius <sci>entiae naturalis pars undecima." For *magica naturalis*, see *De universo* I, 1, 43 (*Opera omnia*, I:648a[F-G])—where William continues the passage quoted above, n. 23, with the words: "et illa nominanda sunt et numeranda in ea parte naturalis scientiae, quae vocatur magica naturalis"—and I, 1, 46 (*Opera omnia*, I:663bD); for *ars magica naturalis*, *De universo* II, 3, 22 (*Opera omnia*, I: 1060bF).

25) William, *De universo* I, 1, 46 (*Opera omnia*, I: 663bF); and *De legibus* 24 (*Opera omnia*, I: 69bD).

Thomas Aquinas

Let me proceed to Thomas Aquinas. Two of the sources I shall use are well known: the *Summa contra gentiles*, begun in the late 1250s and finished early the following decade, and the *Summa theologiae*, the composition of which spanned the years from 1266 to 1273. A third is the interesting but little cited letter from sometime between 1269 and 1272, *De occultis operibus naturae*.[26] In the first of these works, the *Summa contra gentiles*, Thomas introduces his most sustained examination of operations associated with the magical arts. He does so by drawing a bead on Ibn Sina—named, to be sure, Avicenna in the Latin text. The critique of Avicenna then serves as an occasion for Thomas to make plain exactly where on the scale of all phenomena acts of magic sit with regard to the operations of nature.

To be precise about it, Thomas's initial target in the section from *Contra gentiles* was Avicenna's understanding of the influence of separate substances—those spiritual entities ranking above human souls on the scale of being but below God—on objects and actions in the sublunar world. As Thomas explained it, Avicenna held that separate substances, whether resident in the heavens or present below the lunar sphere, could, by the power of their own immaterial form alone, immediately bring about actions in the material world in which we live.[27] Because such actions would come about without the intervention of any material object serving as cause or agent, they would surely appear to most of us as practically miraculous. In fact, of course, since technically speaking they would not violate Avicenna's idea of natural action, they would not constitute authentic miracles but rather just wondrous events—wondrous, that is, from our subjective, limited point of view.[28] A possible example

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26) See Joseph B. McAllister, *The Letter of Saint Thomas Aquinas De occultis operibus naturae ad quemdam militem ultramontanum* (Washington, D.C., 1939), 16.

27) Thomas, *Summa contra gentiles* III, 103 ([Marietti edition] Turin, 1935), 344a: "Fuit autem positio Avicennae quod substantiis separatis multo magis obedit materia ad productionem alicujus effectus quam contrariis agentibus in natura."

28) Thomas, *Contra gentiles* III, 103, 345a: "[L]icet tales effectus simpliciter miracula dici non possint, quia ex naturalibus causis proveniunt, mirabiles tamen redduntur nobis… ."

was when a spirit—in extraordinary cases it might, thought Avicenna, even be a human soul, if the latter were sufficiently purified and separated from the influences of the body in which it dwelled—brought about a cure in a sick person merely by means of its apperception of the person to be cured.[29] To Avicenna's mind, a similar process came into play in the more mundane phenomenon of "bewitchment," when a soul supercharged by an emergent feeling of hatred worked harm on the object of its evil intent merely by means of its gaze.[30]

The spectrum of events suggested by Thomas's words was admittedly extraordinarily wide, and perhaps uncomfortably vague. Included would seem to be everything from exceptional interventions into this lower world by higher spirits to some of the more marvelous and mysterious actions traditionally attributed to especially powerful human souls. In any case, there can be no doubt that Thomas thought Avicenna had in mind here a class of operations and events overlapping those we have seen referred to by William of Auvergne as "*opera magica*." This is plain, moreover, despite the fact that Thomas had not yet employed the word "magic" or any of its cognates. More relevant, for the moment at least, was Thomas's claim that the active process Avicenna intended to suggest with each of his examples was simply corollary to his more celebrated notion of how the separate substances—in strict terms, celestial souls—that animated and moved the planets and stars provided, by means of a strictly Neoplatonic effluence or pouring out, the substantial forms of all objects in the material, natural world.[31]

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29) Thomas, *Contra gentiles* III, 103, 344a-b: "[U]nde ponit quod ad apprehensionem praedictarum substantiarum sequitur interdum effectus aliquis in istis inferioribus, vel pluviarum, vel sanitatis alicujus infirmi, absque aliquo corporeo agente medio… . Et per hunc modum dicit quod, si anima sit pura, non subjecta corporalibus passionibus et fortis in sua apprehensione … ad ejus apprehensionem sanetur aliquis infirmus… ."

30) *Ibid.*, 344b: "Et hoc ponit esse causam fascinationis, quia anima alicujus, vehementer affecta in malevolentia, habet impressionem nocumenti in aliquem… ."

31) Thomas, *Contra gentiles* III, 103, 344b: "Haec autem positio satis consona est aliis suis positionibus. Ponit enim quod omnes formae substantiales effluant in haec inferiora a substantia separata, et quod corporalia agentia non sint nisi disponentia materiam ad suscipiendam impressionem agentis separati… ." Just before these words,

Aquinas proceeded to reject Avicenna on both principal counts—that is to say, with regard to his theory of the generation of substantial forms as well as his explanation of the origin of many wonderful and even magical operations. He did so expressly by wielding what he characterized as an Aristotelian doctrine of natural action among material bodies exclusively by means of contact and local motion. According to Thomas, Aristotle had proven beyond a doubt that the forms of material things did not derive by infusion from separate substances either operating from the heavens or present in the sublunar world but instead from other material forms themselves resident in other material objects. The way material form induced a new material form in a second object was by acting upon the object to produce a similitude of itself.[32] Required in the process was an act of local motion, either that by which the agent object was brought into contact with the object it acted upon to produce a formal alteration or the more complicated movement by which an object, often a living being, generated another entity similar to itself by inducing a form just like its own in matter to which it had at least a mediated access.[33] Of course, all of this—except, to be sure, the technical concept of a process of generation—we have seen before in William of Auvergne, from the demand that natural activity in the world of material things result only upon contact of the agent with the object acted upon to the reference to working by assimilation. Though Thomas did not mention the

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Thomas had reminded his readers of Avicenna's view that among separate substances were the "animae vel motores orbium." For the early thirteenth-century understanding of this view as underlying Avicenna's doctrine of the "dator formarum" or "agent intellect," see Steven P. Marrone, "The Philosophy of Nature in the Early Thirteenth Century," in *Albertus Magnus und die Anfänge der Aristoteles-Rezeption im lateinischen Mittelalter*, ed. Ludger Honnefelder *et al.* (Münster, 2005), 115-57, at 135-41.

32) Thomas continued the quotation with which n. 31 above begins as follows: "[Q]uod quidem non est verum, secundum Aristotelis doctrinam, qui probat quod formae quae sunt in materia non sunt a formis separatis, sed a formis quae sunt in materia; sic enim invenitur similitudo inter faciens et factum."

33) Thomas had already introduced this principle in *Contra gentiles* III, 102, 343b-44a: "Omnis autem effectus qui in his inferioribus producitur, per aliquam generationem vel alterationem necesse est ut producatur. Oportet igitur quod, per aliquid localiter motum, hoc proveniat… ."

second of William's two modes of natural operation, working by contrariety, it is likely that he saw it as falling under his category of action by similarity productive of formal alteration. He did, on the other hand, take the time to explain how embodied spiritual substances such as human souls produced such alterations on objects in the material world in which they lived. They did so by activating the bodies in which they resided—a non-material capability they possessed, purely naturally as William also held, by virtue of their being souls in body—which then in turn either produced further changes in other parts of themselves or impinged on other bodies around them along the standard lines of natural material cause and effect.[34]

As for those wondrous and pseudo-miraculous operations, which we have compared to many of what William had called *opera magica* and which Avicenna had wanted to see as the direct effect of separate celestial substances, Thomas again followed William's path by attributing them to spirits circulating here below. Whether acting on their own or invoked by human wonder-workers, these spirits—describable in more Christian language as angels or demons—manipulated one material object in their power the same way the human body lay in the power of the soul in order consequently to act upon other material objects to render an effect.[35] It was only because the common observer did not see the spirits or understand the natural

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34) The explanation is offered as an answer for how the soul's apprehension of something—for instance, a frightening object—can cause a corporeal effect—in the relevant case, coldness and shivering. See Thomas, *Contra gentiles* III, 103, 344a, and in response, 344b: "[H]ujusmodi autem passiones accidunt cum aliquo determinato motu cordis, ex quo sequitur ulterius immutatio totius corporis, vel secundum motum localem, vel secundum alterationem aliquam; unde adhuc remanet quod apprehensio substantiae spiritualis non alterat corpus, nisi mediante motu locali."

35) Thomas, *Summa contra gentiles* III, 103, 344b-45a: "Substantia igitur spiritualis creata propria virtute nullam formam inducere potest in materiam corporalem, quasi materia ad hoc sibi obediente ut exeat in actum alicujus formae, nisi per motum localem alicujus corporis. Est enim hoc in virtute substantiae spiritualis creatae ut corpus obediat sibi ad motum localem; movendo autem localiter aliquod corpus, adhibere potest aliqua naturaliter activa ad effectus aliquos producendos… . [Q]uum res aliquas naturales vel angeli vel daemones adhibent ad aliquos determinatos effectus, utuntur eis quasi instrumentis quibusdam… . Conveniens est igitur quod ex ipsis

process by which the bodily action occurred that such operations were thought of as miraculous. In fact they remained, as William, too, had insisted, fully natural and largely explicable in terms of local motion and body-to-body contact.[36] At this point, moreover, Thomas finally made explicit reference to magic. Having explained the more stereotypical wonders wrought by spirits and separate substances working largely on their own, Aquinas continued by considering an especially arcane type of exercise that he chose to identify as the works produced by the "magical arts."[37] From what follows it is evident that with this latter term Thomas meant precisely what William had referred to as the *magisterium imaginum*. Not surprisingly, once more he had recourse to the same explanatory narrative as his predecessor. What occurred in such phenomena depended upon the invisible intervention of demonic spirits invoked by the master of the images, which spirits of course performed their wonders in accordance with the natural procedures of material action.[38] Thomas merely added that the images in such instances should be thought of as intentional signs of communication to the demons, much like words.[39]

Where Thomas seems to have differed from William was in the degree of attention he gave to alternative ways of explaining more worldly phenomena of the wonder-producing sort, whether purportedly natural or magical. Like William, Aquinas conceded that there was sometimes strange business in nature, whereby inexplicable results were produced by what would otherwise seem to be ordinary means. The magnet was a case in point, whose elementary attributes as an identifiable material object would not suffice to

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rebus naturalibus proveniant aliqui altiores effectus, ex hoc quod spirituales substantiae eis utuntur quasi instrumentis quibusdam."

36) The fact is made clear in the lines quoted above, n. 28, which immediately follow the passage just given in n. 35.

37) Thomas, *Contra gentiles* III, 104, 345a: "… opera … quae per artes magicas fiunt."

38) The complete argument in this regard is long and sometimes wordy, involving *Summa contra gentiles* III, 104-106, 345b-49b.

39) In fact, William had already briefly anticipated Thomas on this point as well. See William, *De legibus* 27 (*Opera omnia*, I: 89aD).

explain its attractive powers.[40] In such instances, one had to realize that there were hidden or occult powers and forces at work, entirely natural for all their hiddenness but not reducible to the normal mode of material cause and effect by similarity.[41] Thomas was in accord with William that demons themselves sometimes resorted to using such forces to fool people into thinking they were working miracles. The truth was, of course, that they were merely taking advantage of common ignorance about the extent of natural operation.[42] Yet Thomas seems to have regarded the domain of such operations as relatively limited in comparison to the rest of natural activity. At least he spoke about them much less frequently than did William. And it is interesting that on at least one occasion where he touched upon an instance of the workings of a hidden force that William likewise had commented upon—the occult power of a sapphire—he accounted for it as following from the agent's "specific form," in contrast to William's apparently Galenic "whole nature."[43] Although there is no room in this article to offer an explanation, I think of this as a consequence of Thomas's deeper understanding and acceptance of Aristotle's theory of natural cause and effect among material objects by way of the elemental properties of things.[44]

Surely related to this same intensification of Aristotelianizing theory at the expense of recourse to "occult forces"—whether or not

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40) Thomas, *De occultis operibus naturae*, n. 3 (in McAllister, *The Letter of Saint Thomas*, 191).

41) Thomas, *De occultis operibus*, n. 6 (McAllister, 193).

42) See Thomas, *Summa theologiae* II-II, 178, 2, resp. ([Biblioteca de Autores Cristianos] Madrid, 1955), 3, 1101b, which refers back to *Summa theologiae* I, 114, 4, resp. (Biblioteca de Autores Cristianos), 1, 817a.

43) Thomas, *De occultis operibus*, n. 14 (McAllister, 195). For a start in understanding how "specific form" might be considered a replacement for Galen's "whole nature," see Brian P. Copenhaver, "Natural Magic, Hermetism and Early Modern Science: The 'Yates Thesis,'" in *Reappraisals of the Scientific Revolution*, ed. David C. Lindberg and Robert S. Westman (Cambridge, 1990), 261-301, at 272-73; and "Scholastic Philosophy and Renaissance Magic," 540-41.

44) Suggestive in this regard is Newman's rendition of Thomas on Aristotle's view of the relation between the substantial form of a material object and its constituent elements, in *Atoms and Alchemy*, 36-37.

I am right about the sapphire—was Thomas's appropriation into his attack on presumed magic, especially the magic of signs, of a complicated theoretical model for how the celestial bodies, both planets and stars, intervened by means of their motions in the production of a multitude of natural forms—as opposed to wondrous formalities purportedly evoked by images in the *artes magicae*—within the material world.[45] Thomas's ability to explain all such interventions was dependent on the higher order integration into his analytical armory of a model for the generation of substantial forms derivative of Aristotle's theory of natural generation in the material world.[46] The presence of such powerful theoretical tools for analyzing natural operations did not, to be sure, necessitate that Thomas would leave less room in his natural philosophy for something like William's natural magic—a phrase that Thomas would never have been willing to employ—but it did make that result more plausible and more likely. With Thomas, our "protomechanism," a convoluted and greatly Aristotelianizing sort of "mechanism" to be sure, could be seen to entrench itself ever more deeply than in William's day into at least a part of the scholastic milieu.

Giles of Rome

I arrive at last at Giles of Rome. Here we enter more cramped theoretical quarters than were afforded by the grand philosophical considerations of magic in William and Thomas. In fact, we shall focus on a single and quite peculiar scholastic disputed question about how, in a very specific circumstance, a reputedly magical operation might occur. The question has to do with the bleeding—cruentation—of a corpse in the presence of the murderer responsible for the demise of its former animating inhabitant. Belonging to a series of similar questions raised in scholastic dispute over several years, it forms part of an episode in academic politics that Alain Boureau has introduced us to in his *Théologie, science et censure au XIIIe siècle*, revolving around Dominican allegations that John Pecham,

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45) Thomas, *Summa contra gentiles* III, 104, 346a and 347a.

46) For a start, see Thomas, *Summa theologiae* I, 65, 4; I, 91, 2; and I, 115, 4.

Franciscan, student of Bonaventure's and eventually Archbishop of Canterbury, was responsible for the death of his fellow English bishop, Thomas of Cantiloupe.[47] It was a query posed to Giles, probably in order to sow discomfort among members of the Faculty of Theology, in a quodlibetal disputation held at Paris in 1290. The question, number 25 in Giles's *Quodlibet V*, asks whether the wounds of a victim killed in an act of violence would bleed in the presence of the killer.[48] The very fact that such an inquiry into the reality of magic could be handled in so expert and technical a way by a theologian of the late thirteenth century, such as Giles, gives an indication of how well the efforts of those like William and Thomas had prepared the theoretical ground and advanced the technical terms of the debate.

In question 25, Giles accepted, as did most of his university colleagues, that such cruentation could and did occur. The issue was how to explain it. As might be expected, the matter drew its urgency—its theoretical as opposed to political urgency, that is—from the fact that the phenomenon under scrutiny amounted to almost a type of what could be categorized in the scholastic ambience of the day as a magical operation. Under this category would have stood, as we have seen of course already exemplified in the works of William and Thomas, all those wondrous occurrences not readily explicable with reference to the mundane and unremarkable laws of ordinary natural operation that educated minds would by expectation be familiar with. By way of response, Giles ran down a list of potential explanatory accounts for the occurrence from among a stock of standards familiar in the Latin West at least since the twelfth-century collections of Salernitan questions.[49] What interests us is exactly which of these explanations he took as possible, in reality, and which he did not. I shall rapidly summarize.

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47) See Alain Boureau, *Théologie, science et censure au XIIIe siècle. Le cas de Jean Peckham* (Paris, 1999), 237-87.

48) Giles of Rome, *Quodlibet* V, 25 (from his *Quodlibeta* [Bologna, 1481]), 108vb: "[Q]uerebatur de occiso per uiolentiam, utrum ad presentiam occidentis plage emanent sanguine."

49) See *The Prose Salernitan Questions*, ed. Brian Lawn (London, 1979), 130 (q. 269).

First Giles laid before the reader an explication that a group of authorities put forth, proposing that, because a trace of the victim's blood had been left on a knife the returning murderer was still holding or on his clothes, the blood remaining in the corpse was drawn out of the wound by attraction when the killer approached sufficiently closely.[50] The theoretical basis for such an account, added Giles, would have been the general principle of natural operation whereby like attracted like. In this case, since the likeness did not involve a quality, such as heat, but rather the substantial nature of the blood, the general principle had to be reinforced by drawing upon the further notion of a particular kind of attraction, the idea for which he traced back to Avicenna, who had designated it as a mode of operation "by the whole species" (*a tota specie*).[51] From what follows in the text it would appear that without committing himself definitively to the validity of such an Avicennian mode, Giles thought that in any case the rule of attraction would have to be understood as subject to an additional condition. An attraction between two bodies of similar nature, whether qualitative or substantial, was conceivable only in the case where the two possessed the similarity according to differing degrees of perfection.[52]

Theoretical niceties aside, the explanation would not stand no matter how construed. As Giles read the underlying principle, with the requisite condition attached, it was the blood in the victim's corpse that should have attracted the traces of blood present on the

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50) This paragraph and the next depend upon Giles, *Quodlibet* V, q. 25 (Bologna edition, ff. 109ra-b). The first potential explanation is introduced on f. 109ra: "Dicunt enim aliqui quod ex sanguine remanente in cultello uel in uestibus occidentis, quia a simili sit attractio, ideo non potest contingere quod adueniente occisore <non> fiat attractio sanguinis existentis in corpore occisi."

51) Ibid., 109ra: "Unde et quidam talem tractum a tota specie uocant secundum quod distinguit Avicenna triplicem tractum: uidelicet a calido, qui sit a natura elementari, a uacuo, qui uidetur fieri a celesti natura, <et> ibi a tota specie, qui uidetur reduci ad naturam mixti."

52) Ibid., 109ra-b: "… si sit attractio a simili, hoc est quia imperfectum trahitur ad perfectum… . [Q]uare si simile agat in simile et si attrahat simile, non erit omnino simile, cum unum se habebit ut actus, aliud ut potentia, unum secundum quod huiusmodi ut imperfectum, aliud ut perfectum."

person of the killer.[53] Important for us at present, however, is that the whole account drew on the tradition of natural but occult forces operative in the world that we have already seen emergent in both William of Auvergne and Thomas Aquinas. Indeed, Giles's Avicennian phrase "a tota specie" would seem to be kindred to both William's denomination of an occult but natural action "by the whole nature" and Thomas's description of an analogue as by the agent's "specific form." To this degree, Giles's understanding of natural operation was continuous with that of his two predecessors. More significant still is the fact that he found a way to exclude that hermeneutical line from his own approved response. Indeed, he made fun of it, saying that nothing was "stupider" (*stolidius*) than to search for a way to make the rule of similarity, even if refined by linking it to operation "from the whole species," work to prove that blood would attract blood.[54]

With the first proposed explanation neatly disposed of, Giles turned to a second that other authorities advanced, relying not on an occult natural cause but instead on a perfectly routine operation involving material bodies, local motion and contact between agent and acted-upon. Such a mechanistic—or "protomechanistic"—account was one Giles evidently felt quite comfortable with. This was how one would hope actions could be accounted for in the natural world. In the particular case at hand, the explanation ran that in the violence of the act certain material spirits or vapors were generated in both the murderer and the victim. Parts of these spirits or vapors were exchanged through the eyes on the occasion of a mutual glance at the instant of the murder, so that when murderer and corpse were brought together again, the parts sought to return to the source whence they came, following a presumed rule that a part seeks to go back to the whole. The resultant commotion in the matter of

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53) Ibid., 109rb: "[Q]uia perfecta ratio sanguinis magis reseruabitur in eo … qui est in corpore quam in illo qui est in cultello uel in uestibus, per talem attractionem <illa pars> sanguinis qui est in corpore non proced<e>t ad exteriora sed magis <ista pars> sanguinis qui est in cultello uel in uestibus redibit ad corpus."

54) Ibid.: "Quamuis totum hoc dictum sit fantasticum et <nihil> sit stolidius quam ex hoc in potentia consimilare." The text in the Bologna edition is obviously corrupted here, but the general point remains clear enough.

the dead body then led to the emanation of a certain quantity of blood.[55] Despite its down-to-earth attractiveness, however, this was again an answer Giles was forced to reject. Simply put, he proclaimed, we do not observe in nature a regular process of part returning to whole or whole returning to part, except, in the former case, where the original whole is located in the material's natural place.[56] The explanation was thus believable, because expressed in unexceptional terms of mechanistic material act, but there was unfortunately no evidence to support the ostensible rule of nature to which it appealed.

Having twice come up empty-handed, Giles retreated to explanatory ground neither he nor any other scholastic, protomechanistic or not, could find objectionable.[57] When the phenomenon of cruentation did occur—and general opinion confirmed that it sometimes did—the reason would have to lie with one of three causal accounts.[58] First, it could be the result of a direct act of God, by his providence intervening supernaturally to ensure that so horrific a crime did not go unpunished.[59] Second, it could be the work of demons, acting the way William and Thomas had explained with regard to reprehensible works of magic by secretly manipulating material objects so as to procure, by the natural procedures of material

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55) Ibid., 109rb.

56) Ibid., 109rb-va: "Sed cum isti intendant in hoc rationem reddere naturalem, quia nihil tale uidemus in naturalibus, imo magis uidemus oppositum quam propositum … quia non est de natura totius quod tendat ubi est sua pars, nec etiam est de ratione partis quod uadat ad totum nisi quatenus esset totum in loco proprio et pars esset extra locum." On the natural motion of any body towards its proper place, which finds its most famous instantiation in the natural fall of heavy bodies—that is, the phenomenon of *gravitas* or gravity—it is worth looking at the discussion by James A. Weisheipl, "The Principle *Omne quod movetur ab alio movetur* in Medieval Physics," *Isis* 56 (1965), 26-54, at 30-32 and 35-40.

57) This paragraph relies on Giles, *Quodlibet* V, q. 25, 109va.

58) Already ibid., 108vb (*ratio in contrarium*), it was announced that *publica fama* held cruentation to be an authentic occurrence.

59) See Giles's initial listing of the three (ibid., 109va): "His itaque praelibatis, uolumus reddere rationes et causas quomodo hoc possit contingere. Dicemus enim triplici de causa hoc posse esse, uidelicet ex prouidentia Dei, ex falla<c>ia demonum, et ex contingentia casuali."

action and local motion, an apparently wondrous effect. They would of course do so in the hope of inciting some sort of superstition among gullible humans. Alternatively, an instance of cruentation might be simply a matter of chance, a case of mere fortuity.

In all this from Giles, there is not much to enlighten us in detail about theories of natural operation or grand visions of magic as either compatible with or counter to nature. He simply answers the question, drawing upon arguments made many times before and thus needing little in the way of elucidation or justification. But in light of what has already been said about his two predecessors, William and Thomas, even Giles's terseness reveals a lot about how he approached the operations of nature in general. To his eyes, the possibilities of action in the sublunar world were effectively limited to either material causality by contact or divine, and thereby supernatural, intervention. There might be occult natural causes, working even at a modest distance, but they were few and far between and in any case hard to apply to particular instances. Where wondrous things happened, if God was absent, then demons stealthily applying the rules of nature should immediately be suspected as involved. Otherwise, one should simply resist making connections and drawing conclusions, realizing that circumstances often catch us by surprise. A medieval "mechanism," remarkably anticipatory of that of the seventeenth century, was definitely setting in.